

## REFERENCES

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- [1] Miller WS, Zhuang L, Bottema J, Wittebrood AJ, De Smet P, Haszler A and Vieregge A. Recent development in aluminium alloys for the automotive industry. *Materials Science and Engineering A*. 2000; 280 (1): 37-49.
- [2] Kang CG, Son YI, Youn SW. Experimental investigation of semi-solid casting and die design by thermal fluid-solidification analysis. *Journal of Materials Processing Technology*. 2001; 113 251-256.
- [3] Behnam Amin-Ahmadi HA. Semi-solid structure for M2 high speed steel prepared by cooling slope. *Journal of Materials Processing Technology*. 2010; 210 1632-1635.
- [4] Yucel Birol. Internal cooling to produce aluminium alloy slurries for rheocasting. *Journal of Materials Processing Technology*. 2009; 480 365-368.
- [5] Lee K, Kwon YN, Lee S. Correlation of microstructure with mechanical properties and fracture toughness of A356 aluminium alloys fabricated by low pressure casting, rheo casting and casting forging processes. *Engineering Fracture Mechanics*. 2008; 75 4200-4216.
- [6] Liu-qing Y, Yong-Lin K, Fan Z, Jun X. Microstructure and mechanical properties of rheocasting AZ91D mg alloy. *Transactions of Nonferrous Metals Society of China*. 2010; 20 s862-s867.
- [7] Kurz W and Fisher DJ. *Fundamentals of Solidification*. Trans Tech House, 4711, Aedermannsdorf, Switzerland, 1986.
- [8] Dantzig JA and Rappaz M. *Solidification*. EPFL press Lausanne, Switzerland, 2009.
- [9] Spencer DB, Mehrabian R and Flemings MC. Rheological behaviour of sn-15 pct pb in the crystallization range. *Metallurgical Transactions*. 1972; 3 1925-1932.
- [10] Mehrabian R, Riek RG and Flemings MC. Preparation and casting of metal-particulate non-metal composites. *Metallurgical and Materials Transactions*. 1974; 5 1899-1905.
- [11] Flemings MC, Mehrabian R and Riek RG, Continuous process for forming an alloy containing non-dendritic primary solids. United States 3902544, 2 Sept, 1975.
- [12] Flemings MC, Riek RG and Young KP. Rheocasting. *Materials Science and Engineering*. 1976; 25 (0): 103-117.
- [13] Flemings MC. Behaviour of metal alloys in the semisolid state. *Metallurgical Transactions A*. 1991; 22 (5): 957-981.

- [14] Fan Z. Semisolid metal processing. *International Materials Reviews*. 2002; 47 49-85.
- [15] Atkinson HV. Modelling the semisolid processing of metallic alloys. *Progress in Materials Science*. 2005; 50 341-412.
- [16] Chayong S, Atkinson HV and Kapranos P. Thixoforming 7075 aluminium alloys. *Materials Science and Engineering A*. 2005; A390 3-12.
- [17] Jung HK and Kang CG. Induction heating process of an Al-Si aluminium alloy for semi-solid die casting and its resulting microstructure. *Journal of Materials Processing Technology*. 2002; 120 (1-3): 355-364.
- [18] Jiang H, Nguyen TH and Prud'homme M. Optimal control of induction heating for semi-solid aluminium alloy forming. *Journal of Materials Processing Technology*. 2007; 189 (1-3): 182-191.
- [19] Kiuchi M KR. Mushy/Semi-solid metal forming technology - present and future. *CIRP Annals - Manufacturing Technology*. 2002; 51 (2): 653-670.
- [20] O. Lashkari and R. Ghomashchi. The implication of rheology in semi-solid metal processes: An overview. *Journal of Materials Processing Technology*. 2007; 182 229-240.
- [21] Kim WY, Kang CG and Kim BM. The effect of the solid fraction on rheological behaviour of wrought aluminium alloys in incremental compression experiments with a closed die. *Materials Science and Engineering A*. 2007; 447 (1-2): 1-10.
- [22] Haga T and Kapranos P. Simple rheocasting processes. *Journal of Materials Processing Technology*. 2002; 130-131 594-598.
- [23] Hallstedt B, Balitchev E, Shimahara H and Neuschütz D. Semi-solid processing of alloys: Principles, thermodynamic selection criteria, applicability. *ISIJ International*. 2006; 46 (12): 1852-1857.
- [24] Vaneetveld G, Rassili A, Pierret JC and Lecomte-Beckers J. Conception of tooling adapted to thixoforging of high solid fraction hot-crack-sensitive aluminium alloys. *Transactions of Nonferrous Metals Society of China*. 2010; 20 1712-1718.
- [25] Abolhasani D, Ezatpour HR, Sajjadi SA and Abolhasani Q. Microstructure and mechanical properties evolution of 6061 aluminium alloy formed by forward thixoextrusion process. *Material & Design*. 2013; 49 784-790.
- [26] SADOUGH SA, RAHMANI MR and POUYAFAR V. Rheological behaviour, microstructure and hardness of A356 aluminium alloy in semisolid state using backward extrusion process. *Transactions of Nonferrous Metals Society of China*. 2010; 20, Supplement 3 (0): s906-s910.

- [27] Kopp Reiner, Choi Jongung and Neudemberger Dag. Simple compression test and simulation of an Sn–15% pb alloy in the semi-solid state. *Journal of Materials Processing Technology*. 2003; 135 (2–3): 317-323.
- [28] Martin CL, Favier D and Suéry M. Viscoplastic behaviour of porous metallic materials saturated with liquid part II: Experimental identification on a Sn-Pb model alloy. *International Journal of Plasticity*. 1997; 13 (3): 237-259.
- [29] Joly PA and Mehrabian R. The rheology of a partially solid alloy. *Journal of Material Science*. 1976; 11 (8): 1393-1418.
- [30] Quaak CJ. Rheology of Partially Solidified Aluminium Alloys and Composites. 1996 Ph.D Thesis, Technical University of Delft.
- [31] Molenaar JMM, Salemans FWHC, Katgerman L. Analysis of process limits for continuous thixotropic slurry casting. *Journal of Materials Science*. 1985; 20 700-709.
- [32] Flemings MC. Solidification processing. *Metallurgical Transactions*. 1974; 5 (10): 2121-2134.
- [33] Manson-Whitton ED, Stone IC, Jones JR, Grant PS and Cantor B. Isothermal grain coarsening of spray formed alloys in the semi-solid state. *Acta Materialia*. 2002; 50 (10): 2517-2535.
- [34] Kirkwood H. Semisolid metal processing. *International Materials Reviews*. 1994; 39 (5): 173-189.
- [35] Brabazon D, Browne DJ and Carr AJ. Mechanical stir casting of aluminium alloys from the mushy state: Process, microstructure and mechanical properties. *Materials Science and Engineering A*. 2002; A326 370-381.
- [36] Kirkwood DH, Sellars CM and Boyed LGE, Thixotropic materials. United State 5133811, 1992.
- [37] Chen J and Fan Z. Modelling of rheological behaviour of semisolid metal slurries Part 1–Theory. *Materials Science and Technology*. 2002; 18 (3): 237-242.
- [38] Fan Z and Chen J. Modelling of rheological behaviour of semisolid metal slurries part 2–Steady state behaviour. *Materials Science and Technology*. 2002; 18 (3): 243-249.
- [39] Hirai M, Takebayashi K and Yoshikawa Y. Effect of chemical composition on apparent viscosity of semi-solid alloys. *ISIJ International*. 1993; 33 (11): 1182-1189.
- [40] Kuang -O (Oscar) Yu, Modeling for Casting and Solidification Processing. United State of America, Marcel Dekker, 2002.
- [41] Rassili A and Atkinson HV. A review on steel thixoforming. *Transactions of Nonferrous Metals Society of China*. 2010; 20, Supplement 3 (0): s1048-s1054.

- [42] Bunck M, Warnken N and Buhrig-Polaczek A. Microstructure evolution of rheo-cast A356 aluminium alloy in consideration of different cooling conditions by means of the cooling channel process. *Journal of Materials Processing Technology*. 2010; 210 624-630.
- [43] R.E. Reed-Hill and R. Abbaschian, *Physical Metallurgy Principles*, 3rd ed. Boston, PWS-KEN Pub, 1992.
- [44] Bäckerud L, Chai G, et al, *Solidification Characteristics of Aluminium Alloys; Volume 2: Foundry Alloys*. University of Stockholm, 1991.
- [45] Tomer A. *Structure of Metals through Optical Microscopy*. USA, 1991.
- [46] Guan W, Gao Y, Zhai Q and Xu K. Undercooling of droplet solidification for molten pure aluminium. *Materials Letters*. 2005; 59 (13): 1701-1704.
- [47] T. F. Bower and M. C. Flemings. *Trans. Met. Soc. AIME*. 1967; 239 1620-1625.
- [48] Chinesta F, Cueto EI, et al. *Current Status of Semi-Solid Processing of Metallic Materials*. 2007.
- [49] Lyons SC, *Methods and apparatus for classifying fine particle solids*. United States 4209128, 24 June, 1980.
- [50] Kang CG, Yoon JH and Seo YH. The upsetting behaviour of semi-solid aluminium material fabricated by a mechanical stirring process. *Journal of Materials Processing Technology*. 1997; 66 30-38.
- [51] Mao W, Zhen Z, Yan Shijian and Zhong X. Rheological behaviour of semi-solid AZ91D alloy. *Journal Material Science Technology*. 2004; 20 (5): 580-582.
- [52] McLelland ARA, Henderson NG, Atkinson HV and Kirkwood DH. Anomalous rheological behaviour of semi-solid alloy slurries at low shear rates. *Materials Science and Engineering: A*. 1997; 232 (1-2): 110-118.
- [53] Liu TY, Atkinson HV, Ward PJ and Kirkwood DH. Response of semi-solid Sn15 pct pb to rapid shear-rate changes. *Metallurgical and Materials Transactions A*. 2003; 34A (- 2): 409-417.
- [54] Brabazon D, Browne DJ and Carr AJ. Experimental investigation of the transient and steady state rheological behaviour of Al-Si alloys in the mushy state. *Materials Science and Engineering A*. 2003; A356 68-80.
- [55] Fiorini P, Zanardi L and Pellegrini V. Primary and wrought products for semi-solid forming of aluminium alloys in *International Conference of Al Alloys: New Process Technologies*. Associazione Italiana Di Metallurgia, Marina Di Ravenna, Italy, 3rd-4th June. 1993.pp. 117-128.
- [56] Abis S. Industrial plant for casting and forming semi-solid aluminium alloy billets in *International Conference of Al Alloys: New Process Technologies*.

Associazione Italiana Di Metallurgia, Marina Di Ravenna, Italy, 3rd-4th June. 1993. pp. 181-189.

[57] Collot Jean. Review of new process technology in the aluminium die-casting industry. *Material and Manufacturing Processes*. 2001; 16 (5): 595-617.

[58] Moschini Renzo, A continuous semi-liquid casting process and a furnace for performing the process. European Patent Application EP0411329, June, 1994.

[59] Pellegrini V and Abis S, Apparecchiatura per la Produzione Mediate Raffreddamento Sotto Agitazione di Leghe Metalliche Allo Stato Semiliquido o Pastoso. Italian Patent Application 19617 A, 1987.

[60] Ramati SDE, Backman DG, Murty YV, Abbaschian GJ and Mehrabian R. Fundamental aspects of rheocasting. *Rheocasting Battelle Columbus Laboratories Ohio*. 1978; 13-32.

[61] Wang XJ, Nie KB, Sa XJ, Hu XS, Wu K and Zheng MY. Microstructure and mechanical properties of SiCp/MgZnCa composites fabricated by stir casting. *Materials Science and Engineering: A*. 2012; 534 (0): 60-67.

[62] Kalaiselvan K, Murugan N and Parameswaran Siva. Production and characterization of AA6061-B4C stir cast composite. *Material Design*. 2011; 32 (7): 4004-4009.

[63] Naher S, Brabazon D and Looney L. Development and assessment of a new quick quench stir caster design for the production of metal matrix composites. *Journal of Materials Processing Technology*. 2005; 166 (3): 430-439.

[64] Naher S, Brabazon D and Looney L. Simulation of the stir casting process. *Journal of Material Processing Technology*. 2003; 143-144 (0): 567-571.

[65] Ashok Kumar B and Murugan N. Metallurgical and mechanical characterization of stir cast AA6061-T6-AlNp composite. *Material Design*. 2012; 40 (0): 52-58.

[66] Fredrick PS, Bradley NL and Erickson SC. Injection moulding magnesium alloys. *Advanced materials and Processes*. 1988; 53-56.

[67] Carnahan R and Decker R. Net shape forming by thixomoulding. *Metal and Materials*. 1990; 6 (9): 577-579.

[68] Kilbet RK, Fredrick PS, Bradley NL, Newman RD and Carnahan RC. Thixomoulded magnesium: A new standard in quality in North American Die Casting Association (NADCA), 16th Congress and Exposition. 30th Sept - 3rd Oct. 1991. pp. 1-4.

[69] Zhang YF, Liu YB, Cao ZY, Zhang QQ and Zhang L. Mechanical properties of thixomolded AZ91D magnesium alloy. *Journal of Material Processing Technology*. 2009; 209 (3): 1375-1384.

- [70] Xianfeng Pan, Haifeng Zheng, Aimin Wang, Bingzhe Ding, Keqiang Qui and Zhuangqi Hu. Trend and development of semi-solid metal processing. *Journal of Materials Science and Technology*. 2000; 16 (5): 453-460.
- [71] Akhihiko Namba. Light metal. 1995 (in Japanese). In Xianfeng P, Haifeng Z, et al. [70];
- [72] Shuncheng Wang, Furong Cao, Yinglong Li and Jinglin Wen. Continuous extruding extending forming of semi-solid A2017 alloy. *Journal of Wuhan University of Technology--Materials Science Edition*. 2006; 21 (1): 76-79.
- [73] Shuncheng Wang, Furong Cao, Renguo Guan and Jinglin Wen. Formation and evolution of non-dendritic microstructures of semi-solid alloys prepared by shearing/cooling roll process. *Journal of Materials Science and Technology*. 2006; 22 (2): 195-199.
- [74] Guan RG, Zhao ZY, Zhang H, Lian C, Lee CS and Liu CM. Microstructure evolution and properties of Mg–3Sn–1Mn (wt%) alloy strip processed by semisolid rheo-rolling. *Journal of Material Processing Technology*. 2012; 212 (6): 1430-1436.
- [75] Zhao Hu, Li Peijie and He Liangju. Microstructure and mechanical properties of an asymmetric twin-roll cast AZ31 magnesium alloy strip. *Journal of Material Processing Technology*. 2012; 212 (8): 1670-1675.
- [76] Depierreux A, Knaff F, Henrion R, Martinussen N, Naveau P and Wilmotte S. High speed continuous casting for blooms and billets in 1st European Conference on Continuous Casting. 23-25 Sept 1991.pp. 1.297-1.312.
- [77] Walmag G, Naveau P, Rassili A and Sinnaeve M. A new processing route for as-cast thixotropic steel. *Solid State Phenomena*. 2008; 141-143 415-420.
- [78] Zoqui EJ, Paes M and Es-Sadiqi E. Macro- and microstructure analysis of SSM A356 produced by electromagnetic stirring. *Journal of Material Processing Technology*. 2002; 120 (1–3): 365-373.
- [79] Kapranos P, Ward PJ, Atkinson HV and Kirkwood DH. Near net shaping by semi-solid metal processing. *Material Design*. 2000; 21 (4): 387-394.
- [80] Kenney MP, Courtois JA, et al, *Metal Handbook.*, vol. 15, Metal Parks, OH, pp. 327-338. ASM International, 1988.
- [81] Turng LS and Wang KK. Rheological behaviour and modelling of semi-solid sn-15% pb alloy. *Journal of Material Science*. 1991; 26 (26): 2173 - 2183.
- [82] Meyer Jean-luc, Method for regulating the level of the contact line of the free metal surface with the continuous-casting mould in a vertical casting. European Patent EP0277889, August, 1990.
- [83] Yan-hua LI, Zhi-jian SU and Ji-cheng HE. Effect of linear electromagnetic stirring on behaviour of liquid metal and rate of slag-metal interfacial reactions. *Journal of Iron and Steel Research, International*. 2010; 17 (8): 10-14.

- [84] Xiong Bowen, Cai Changchun, Wan Hong and Lu Baiping. Fabrication of high chromium cast iron and medium carbon steel bimetal by liquid–solid casting in electromagnetic induction field. *Material Design*. 2011; 32 (5): 2978-2982.
- [85] Bai Fudong, Sha Minghong, Li Tingju and Lu Lianhai. Influence of rotating magnetic field on the microstructure and phase content of Ni–Al alloy. *Journal of Alloys Compounds*. 2011; 509 (14): 4835-4838.
- [86] Chen X, Zhang Z and Xu J. Effects of annular electromagnetic stirring processing parameters on semi-solid slurry production. *Transactions of Nonferrous Metals Society of China*. 2010; 20, Supplement 3 (0): s873-s877.
- [87] Charles Vives. Elaboration of metal matrix composites from thixotropic alloy slurries using a new magnetohydrodynamic caster. *Metallurgical Transactions B*. 1993; 24B 493-510.
- [88] Singer ARE. Recent developments in the spray forming of metals. *International Journal of Powder Metallurgy*. 1985; 21 (3): 219.
- [89] Raju K, Ojha SN and Harsha AP. Spray forming of aluminium alloys and its composites: An overview. *Journals of Materials Science*. 2008; 43 2509-2521.
- [90] Ward PJ, Atkinson HV, Anderson PRG, Elias LG, Garcia B, Kahlen L and Rodriguez-ibabe JM. Semi-solid processing of novel MMCs based on hypereutectic aluminium-silicon alloys. *Acta Materialia*. 1996; 44 (5): 1717-1727.
- [91] Hogg SC, Atkinson HV and Kapranos P. Semi-solid rapid compression testing of spray-formed hypereutectic Al-Si alloys. *Metallurgical and Materials Transactions A*. 2004; 35A 899-910.
- [92] Grant PS. Spray forming. *Progress in Materials Science*. 1995; 39 (4–5): 497-545.
- [93] Jones PDA, Duncan SR, Rayment T and Grant PS. Control of temperature profile for a spray deposition process. *IEEE Transactions Control SystemTechnology*. 2003; 11 (5): 656-667.
- [94] Murty SB, Kori AS and Chakraborty M. Grain refinement of aluminium and its alloys by heterogeneous nucleation and alloying. *International Materials Reviews*. 2002; 47 (1):
- [95] McCartney GD. Grain refining of aluminium and its alloys using inoculants. *International Materials Reviews*. 1989; 34 (5):
- [96] Mohanty PS and Gruzleski JE. Mechanism of grain refinement in aluminium. *Acta Metallurgica et Materialia*. 1995; 43 (5): 2001-2012.
- [97] Birol Yücel. Effect of the salt addition practice on the grain refining efficiency of Al–Ti–B master alloys. *Journal of Alloys Compounds*. 2006; 420 (1–2): 207-212.

- [98] Charles Vivès. Effects of forced electromagnetic vibrations during the solidification of aluminium alloys: Part I. solidification in the presence of crossed alternating electric fields and stationary magnetic fields. Metallurgical and Materials Transactions B. 1996; 27 (3): 445-455.
- [99] Abramov VO, Straumal BB and Gust W. Hypereutectic Al-Si based alloys with a thixotropic microstructure produced by ultrasound treatment. Materials & Design. 1997; 18 323-326.
- [100] Loué WR and Suéry M. Microstructural evolution during partial remelting of AlSi7Mg alloys. Materials Science and Engineering: A. 1995; 203 (1–2): 1-13.
- [101] Bergsma SC, Tolle MC, Kassner ME, Li X and Evangelista E. Sémi-solid thermal transformations of Al–Si alloys and the resulting mechanical properties. Materials Science and Engineering: A. 1997; 237 (1): 24-34.
- [102] Xia K and Tausig G. Liquidus casting of a wrought aluminium alloy 2618 for thixoforming. Materials Science and Engineering: A. 1998; 246 (1–2): 1-10.
- [103] Tzimas E and Zavaliangos A. Evolution of near-equiaxed microstructure in the semisolid state. Materials Science and Engineering: A. 2000; 289 (1–2): 228-240.
- [104] Adachi, Sato, Harada and Sasaki, Method of shaping semisolid metals. European EP0841406, August, 2001.
- [105] Mitsuru A, Hiroto S, Yasunori H, Tatsuo S, Satoru S and Atsushi Y, Method and Apparatus for Shaping Semisolid Metals. UBE EP0745694 A1, 1996.
- [106] Cardoso E, Atkinson HV and Jones H. Microstructural evolution of A356 during NRC processing in The 8th International Conference on Semi Solid Processing of Alloys and Composites, Limassol, Cyprus, 21-23 September 2004. 2004.
- [107] Kaufmann H, Fragner W and Uggowitzer PJ. Influence of variation in alloy composition on castability and process stability. Part 2; semi-solid casting processes. International Journal of Cast Metals Research. 2005; 18 (5): 279-285.
- [108] Doutre D, Hay G, Wales P and Alcan International Ltd, Semi-solid concentration processing of metallic alloys. United States Patent US 6428636 B2, 2002.
- [109] Gerhard H and Reiner K, Thixoforming: Semi-Solid Metal Processing, 1st ed. Germany, Wiley-VCH Verlag, 2009.
- [110] Langlias J and Lemieux A. Proceeding of the 9<sup>Th</sup> S2P Conference Korea. 2006. In Gerhad H and Reiner K [109].



- [111] Tebib M, Morin JB and Chen XG. Semi-solid processing of hypereutectic A390 alloys using novel rheoforming process. Transactions of Nonferrous Metals Society of China. 2010; 20 1743-1748.
- [112] Findon M. Semi-solid slurry formation via liquid metal mixing. Master Thesis Worcester Polytechnic Institute. 2003 Master Thesis Worcester Polytechnic Institute.
- [113] Findon M and Apelian D. Continuous rheoconversion process (CRP): For semi-solid slurry production [J]. Transaction of the American Foundry Society. 2004; 112 305-323.
- [114] Apelian D, Pan QY and Findon M. Low cost and energy efficient methods for the manufacture of semi-solid (SSM) feedstock [J]. Die Casting Engineer. 2004; 48(1) 22-28.
- [115] Pan QY, Apelian D and Hogan P. The continuous rheoconversion process (CRP): Optimization & industrial applications in Proceeding 3rd International Conference on High Tech Die Casting, AIM, Vicenza, Italy, September 21-22. 2006.
- [116] Bo X, Yuan Dong L, Ying M, Yuan H and Apelian D. Commercial AM60 alloy for semisolid processing: Effects of continuous rheoconversion process on microstructure. Transactions of Nonferrous Metals Society of China. 2010; 20 s723-s728.
- [117] Guo H and Yang X. Proceedings of the 9<sup>Th</sup> S2P Conference Korea 2006. In Gerhad H and Reiner K [109].
- [118] Hongmin G and Xiangjie Y. Morphology evolution of primary particles in LSPSF rheocasting process. International Journal of Modern Physics B. 2009; 23 (6&7): 881-887.
- [119] Hongmin G, Xiangjie Y and Bin H. Low superheat pouring with a shear field in rheocasting of aluminium alloys. Journal of Wuhan University of Technology - Materials Science Edition. 2007; 23 (1): 54-59.
- [120] Hussey MJ, Browne DJ, Brabazon D and Car AJ. A direct thermal method of attaining globular morphology in the primary phase of alloys in Proceedings of the 7th International Conference on Semi-Solid Processing of Alloys and Composites. 2002. pp. 575-580.
- [121] Ahmad A, Naher S and Brabazon D. Effects of direct thermal method temperature and time on A356 microstructure in 15<sup>Th</sup> International Conference on Advances Materials and Processing Technology. 23-26 September 2012.
- [122] Carr AJ, Browne DJ, Hussey MJ, Lumsden N and Scanlan M. Modelling and experimental development of the direct thermal method of rheocasting. International Journal of Cast Metals Research. 2007; 20 (6): 325-332.

- [123] Browne DJ, Hussey MJ and Carr AJ. Towards optimisation of the direct thermal method of rheocasting in 8th International Conference on Semi-Solid Processing of Alloys and Composites. 2004.
- [124] Browne DJ, Hussey MJ, Carr AJ and Brabazon D. Direct thermal method: New process for development of globular alloy microstructure. International Journal of Cast Metals Research. 2003; 16 (4): 418-426.
- [125] Metals Handbook, Vol.2 - Properties and Selection: Nonferrous Alloys and Special-Purpose Materials., 10th ed.ASM International, 1990.
- [126] Kreith F, Manglik RM, et al. Principles of Heat Transfer. (Seventh ed.) 2011.
- [127] Aguilar J, Grimming T and Buhrig Polaczek A. Rheo container process (RCP): new semi solid forming method for light alloys in Proceedings of the 6<sup>th</sup> International Conference on Magnesium Alloys and their Applications. 2003. pp. 767-773.
- [128] Grimming T, Aguilar J and Buhrig Polaczek A. Optimization of the rheocasting under consideration of the main influence parameters on the microstructure in Proceeding of the 8<sup>th</sup> S2P International Conference on Semi-Solid Processing of Alloys and Composites. 2004.
- [129] Haga Toshio and Suzuki Shinsuke. Casting of aluminium alloy ingots for thixoforming using a cooling slope. Journal of Material Processing Technology. 2001; 118 (1–3): 169-172.
- [130] Birol Yücel. Cooling slope casting and thixoforming of hypereutectic A390 alloy. Journal of Material Processing Technology. 2008; 207 (1–3): 200-203.
- [131] Young KP, Kyonka CP and Courtois JA, Fine grained metal composition. United States 4415374, 15 Nov, 1983.
- [132] Ji Z, Hu Z and Zheng X. Effect of holding time on thixotropic fluidity of semi-solid AZ91D magnesium alloy. Journal of Materials Science and Technology. 2007; 23 (2): 247-252.
- [133] Jiang Haitao, Li Xiaoli, Xiong Aiming and Li Miaoquan. Fabrication and microstructure evolution of semi-solid LY11 alloy by SIMA. Journal of Materials Engineering and Performance. 2003; 12 (3): 249-253.
- [134] Zhang QQ, Cao ZY, Liu YB, Zhang YF, Zhang L, Zhang Milin and Wu Ruizhi. Effect of asymmetrical deformation on the microstructure evolution of semisolid AZ91D alloy. Materials Science and Engineering: A. 2008; 488 (1–2): 260-265.
- [135] Wang JG, Lin HQ, Li YQ and Jiang QC. Effect of initial as-cast microstructure on semisolid microstructure of AZ91D alloy during the strain-induced melt activation process. Journal of Alloys Compounds. 2008; 457 (1–2): 251-258.

- [136] Chan Choi Jae and Jin Park Hyung. Microstructural characteristics of aluminium 2024 by cold working in the SIMA process. *Journal of Material Processing Technology*. 1998; 82 (1–3): 107-116.
- [137] Kirkwood DH, Sellars CM and Elias Boyed LG, US 5133811, 1992.
- [138] Liu D, Atkinson HV, Kapranos P, Jirattiticharoean W and Jones H. Microstructural evolution and tensile mechanical properties of thixoformed high performance aluminium alloys. *Materials Science and Engineering A*. 2003; A361 213-224.
- [139] Qin QD, Zhao YG, Cong PJ, Zhou W and Xu B. Semisolid microstructure of Mg<sub>2</sub>Si/Al composite by cooling slope cast and its evolution during partial remelting process. *Materials Science and Engineering: A*. 2007; 444 (1–2): 99-103.
- [140] Luo Shoujing, Chen Qiang and Zhao Zude. An investigation of microstructure evolution of RAP processed ZK60 magnesium alloy. *Materials Science and Engineering: A*. 2009; 501 (1–2): 146-152.
- [141] Zhao Zude, Chen Qiang, Chao Hongying and Huang Shuhai. Microstructural evolution and tensile mechanical properties of thixoforged ZK60-Y magnesium alloys produced by two different routes. *Material Design*. 2010; 31 (4): 1906-1916.
- [142] Omar MZ, Atkinson HV, Palmier EJ, Howe AA and Kapranos P. Thixoforming two different steels in The 9th International ESAFORM Conference on Material Forming, Glasgow, U.K., April 26-29. 2006.pp. 847-850.
- [143] Bo X, Yuandong L, Ma Y and Yuan H. Effect of novel self-inoculation method on microstructure of AM60 alloy. *China Foundry*. 2011; 8 (1) 121-126.
- [144] Xing Bo, LI Yuan-dong, Ma Ying, ChenTi-jun and Hao Yuan. Microstructure of partially remelted billet of AM60 alloy prepared with self-inoculation method. *Transactions of Nonferrous Metals Society of China*. 2010; 20 (9): 1622-1629.
- [145] Easton MA, Kaufmann H and Fragner W. The effect of chemical grain refinement and low superheat pouring on the structure of NRC castings of aluminium alloy Al–7Si–0.4Mg. *Materials Science and Engineering: A*. 2006; 420 (1–2): 135-143.
- [146] Nafisi Shahrooz and Ghomashchi Reza. Grain refining of conventional and semi-solid A356 Al–Si alloy. *Journal of Material Processing Technology*. 2006; 174 (1–3): 371-383.
- [147] Nafisi S and Ghomashchi R. Combined grain refining and modification of conventional and rheo-cast A356 al-si alloy. *Materials Characterisation*. 2006; 57 371-385.

- [148] Gencalp S and Saklakoglu N. Semisolid microstructure evolution during cooling slope casting under vibration of A380 aluminium alloy. *Materials and Manufacturing Processes*. 2010; 25 (9): 943-947.
- [149] Nie KB, Wang XJ, Wu K, Xu L, Zheng MY and Hu XS. Processing, microstructure and mechanical properties of magnesium matrix nanocomposites fabricated by semisolid stirring assisted ultrasonic vibration. *Journal of Alloys and Compounds*. 2011; 509 (35): 8664-8669.
- [150] Lü S, Wu S, Zhu Z, An P and Mao Y. Effect of semi-solid processing on microstructure and mechanical properties of 5052 aluminium alloy. *Transactions of Nonferrous Metals Society of China*. 2010; 20 s758-s762.
- [151] Rogal Ł, Dutkiewicz J, Atkinson H, Lityńska-Dobrzyńska L, Czeppe T and Modigell M. Characterization of semi-solid processing of aluminium alloy 7075 with sc and zr additions. *Materials Science and Engineering A*. 2013; 580 362-373.
- [152] Oh S, Bae J and Kang C. Effect of electromagnetic stirring conditions on grain size characteristic of wrought aluminium for rheo-forging. *Journal of Materials Engineering and Performance*. 2008; 17 (1): 57-63.
- [153] Guo H, Yang X, Wang J, Hu B and Zhu G. Effects of rheoforming on microstructures and mechanical properties of 7075 wrought aluminium alloy. *Transactions of Nonferrous Metals Society of China*. 2010; 20 355-360.
- [154] Mohammadi H and Ketabchi M. Investigation of microstructural and mechanical properties of 7075 al alloy prepared by SIMA method. *Iranian Journal of Materials Science & Engineering*. 2013; 10 (3):
- [155] Guo H, Yang X, Wang J, Hu B and Zhu G. Effects of rheoforming on microstructures and mechanical properties of 7075 wrought aluminium alloy. *Transactions of Nonferrous Metals Society of China*. 2010; 20 (3): 355-360.
- [156] Dong J, Cui JZ, Le QC and Lu GM. Liquidus semi-continuous casting, reheating and thixoforming of a wrought aluminium alloy 7075. *Materials Science and Engineering A*. 2003; A345 234-242.
- [157] Mahathaninwong N, Plookphol T, Wannasin J and Wisutmethagoon S. T6 heat treatment of rheocasting 7075 al alloy. *Materials Science and Engineering A*. 2012; A532 91-99.
- [158] Wang C, Tang Z, Mei H, Wang L, Li R and Li D. Formation of spheroidal microstructure in semi-solid state and thixoforming of 7075 high strength aluminium alloy. *Rare Metals*. 1-7.
- [159] Vaneetveld G, Rassili A, Pierret JC and Lecomte-Beckers J. Improvement in thixoforging of 7075 aluminium alloys at high solid fraction. *Semi-Solid Processing of Alloys and Composites X*. 2008; 141-143 707-712.
- [160] Campbell J. *Castings Practice: The Ten Rules of Castings*. Butterworth-Heinemann, 2004.

- [161] Dieter GE and Bacon D. Mechanical Metallurgy. McGraw-Hill New York, 1986.
- [162] Lampman SR. ASM handbook: Volume 19, fatigue and fracture. ASM International. 1996;
- [163] Yucel Birol. A357 thixoforming feedstock produced by cooling slope casting. Journal of Materials Processing Technology. 2007; 186 94-101.
- [164] Xiao-rong Y, Wei-min M, Bin-yu S. Preparation of semisolid A356 alloy slurry with larger capacity cast by serpentine channel. Transactions of Nonferrous Metals Society of China. 2011; 21 455-460.
- [165] Polmear IJ, Light Alloys: From Traditional Alloys to Nanocrystals., 4th ed. United Kingdom, Butterworth-Heinemann, 2006.
- [166] Kaufman JG, Introduction to Aluminium Alloys and Tempers. United State of America, ASM International, 2000.
- [167] STAMPAL [Online]. <http://www.stampal-sb.si/> [accessed: 25 June 2014]
- [168] GROVE AIRCRAFT [Online]. <http://www.groveaircraft.com/> [accessed: 25 June 2014]
- [169] ALCOA [Online]. <http://www.alcoa.com/global/en/home.asp> [accessed: 25 June 2014]
- [170] JJ CHURCHILL LTD [Online]. <http://jjchurchill.com/> [accessed: 25 June 2014]
- [171] ASM International, Properties and Selection: Nonferrous Alloys and Special-Purpose Materials., vol. 2, USA, 1992.
- [172] Curle UA. Semi-solid near shape rheocasting of heat treatable wrought aluminium alloys. Transactions of Nonferrous Metals Society of China. 2010; 20 1719-1724.
- [173] Alvarez L, Luis CJ, Puertas I. Analysis of the influence of chemical composition on the mechanical and metallurgical properties of engine cylinder blocks in grey cast iron. Journal of Materials Processing Technology. 2004; 153-154 1039-1044.
- [174] Chino Y, Nakanishi H, Kobata M, Iwasaki H. and Mabuchi M. Processing of a porous 7075 al alloy by bubble expansion in a semi-solid state. Scripta Materialia. 2002; 47 769-773.
- [175] Atkinson HV, Burke K and Vaneetveld G. Recrystallisation in the semi-solid state in 7075 aluminium alloy. Materials Science and Engineering A. 2008; A490 266-276.

- [176] Rikhtegar F and Mostafa K. Investigation of mechanical properties of 7075 aluminium alloy formed by forward thixoextrusion process. *Materials and Design*. 2010; 31 3943-3948.
- [177] Rokni MR, Zarei-Hanzaki A, Abedi HR and Haghdadi N. Microstructure evolution and mechanical properties of backward thixoextruded 7075 aluminium alloy. *Materials and Design*. 2011;
- [178] Don-In Jang, Young-Ok Yoon and Shae K Kim. Thixoextrusion for 7075 aluminium wrought alloy tube. *Semi-Solid Processing of Alloys and Composites X*. 2008; 141-143 267-270.
- [179] Adriana Neag, Veronique Favier, Mariana Pop, Eric Becker and Regis Bigot. Effect of experimental conditions on 7075 aluminium response during thixoextrusion. *Key Engineering Materials*. 2012; 504-506 345-350.
- [180] Arnberg L, Chai G and Backerud L. Determination of dendritic coherency in solidifying melts by rheological measurements. *Materials Science and Engineering A*. 1993; 173 (1-2): 101-103.
- [181] Masuku EP, Möller H, Curle UA, Pistorius PC and Li W. Influence of surface liquid segregation on corrosion behaviour of semi-solid metal high pressure die cast aluminium alloys. *Transactions of Nonferrous Metals Society of China*. 2010; 20 s837-s841.
- [182] Mohammadi H, M Ketabchi and Kalaki A. Microstructure evolution of semi-solid 7075 aluminium alloy during reheating process. *Journal of Materials Engineering and Performance*. 2011; 20 1256-1263.
- [183] Lee Sang-Yong, Lee Jung-Hwan and Lee Young-Seon. Characterization of al 7075 alloys after cold working and heating in the semi-solid temperature range. *Journal of Materials Processing Technology*. 2001; 111 42-47.
- [184] Daniels T, *Thermal Analysis*. United Kingdom, Kagon Page Limited, 1973.
- [185] Emadi D, Whiting LV, Nafisi S and Gomashchi R. Applications of thermal analysis in quality control of solidifications processes. *Journal of Thermal Analysis and Calorimetry*. 2005; 81 235-242.
- [186] Canales A, Talamantes-Silva J, Gloria D, Valtierra S and Colás R. Thermal analysis during solidification of cast Al-Si alloys. *Thermochimica Acta*. 2010; 510 (1): 82-87.
- [187] Karthikeyan B, Ramanathan S and Ramakrishnan V. A calorimetric study of 7075 Al/SiCp composites. *Material Design*. 2010; 31 S92-S95.
- [188] Djurdjevic MB, Odanovic Z and Talijan N. Characterization of the solidification path of AlSi5Cu (1-4 wt.%) alloys using cooling curve analysis. *JOM*. 2011; 63 (11): 51-57.
- [189] Zhang L, Li W and Yao J. Microstructures and thermal stability of the semi-solid 2024 aluminium alloy prepared using the pulsed magnetic field

process: Effects of technological parameters. *Journal of Alloys Compounds*. 2013; 554 156-161.

[190] Yucel Birol. Solid fraction analysis with DSC in semi-solid metal processing. *Journal of Alloys and Compounds*. 2009; 486 173-177.

[191] Neag Adriana, Favier Véronique, Bigot Régis and Pop Mariana. Microstructure and flow behaviour during backward extrusion of semi-solid 7075 aluminium alloy. *Journal of Material Processing Technology*. 2012; 212 (7): 1472-1480.

[192] Chayong S, Atkinson HV and Kapranos P. Multistep induction heating regimes for thixoforming 7075 aluminium alloy. *Materials Science and Technology*. 2004; 20 490-4969.

[193] Makhoul M, Apelian D, et al, *Microstructures and Properties of Aluminium Die Casting Alloys*, vol. 215, 1998.

[194] Savitsky A and Golay MJE. Smoothing and differentiation of data by simplified least squares procedures. *Analytical Chemistry*. 1964; 36 1627-1639.

[195] Çetin A and Kalkanli A. Effect of solidification rate on spatial distribution of SiC particles in A356 alloy composites. *Journal of Material Processing Technology*. 2008; 205 (1-3): 1-8.

[196] Amin KM and Mufti Nadeem A. Investigating cooling curve profile and microstructure of a squeeze cast Al-4%Cu alloy. *Journal of Material Processing Technology*. 2012; 212 (8): 1631-1639.

[197] Shabestari SG and Malekan M. Assessment of the effect of grain refinement on the solidification characteristics of 319 aluminium alloy using thermal analysis. *Journal of Alloys and Compounds*. 2010; 492 134-142.

[198] Farahany S, Ourdjini A and Idris M. The usage of computer-aided cooling curve thermal analysis to optimise eutectic refiner and modifier in Al-Si alloys. *Journal of thermal analysis and calorimetry*. 2012; 109 (1): 105-111.

[199] Hosseini VA, Shabestari SG and Gholizadeh R. Study on the effect of cooling rate on the solidification parameters, microstructure, and mechanical properties of LM13 alloy using cooling curve thermal analysis technique. *Material Design*. 2013; 50 (0): 7-14.

[200] Farahany S, Ourdjini A, Idris M and Shabestari S. Computer-aided cooling curve thermal analysis of near eutectic Al-Si-Cu-Fe alloy. *Journal of thermal analysis and calorimetry*. 2013; 114 (2): 705-717.

[201] Liang S, Chen R, Blandin J, Suery M and Han E. Thermal analysis and solidification pathways of Mg-Al-Ca system alloys. *Materials Science and Engineering: A*. 2008; 480 (1): 365-372.

- [202] Huang Z, Liang S, Chen R and Han E. Solidification pathways and constituent phases of Mg–Zn–Y–Zr alloys. *Journal of Alloys Compounds*. 2009; 468 (1): 170-178.
- [203] Pekguleryuz M, Li X and Aliravci C. In-situ investigation of hot tearing in aluminium alloy AA1050 via acoustic emission and cooling curve analysis. *Metallurgical and Materials Transactions A*. 2009; 40 (6): 1436-1456.
- [204] Dahkle AK SD. Rheological behaviour of the mushy zone and its effects on the formation of casting defects during solidification. *Acta Metallurgica*. 1998; 47 (1): 31-41.
- [205] Chandrashekar T, Muralidhara MK, Kashyap KT and Roa PR. Effect of growth restricting factor on grain refinement of aluminium alloys. *International Journal Advance Manufacturing Technology*. 2009; 40 234-241.
- [206] Hahn TA and Armstrong RW. Thermal expansion properties of 6061 al alloy reinforced with SiC particles or short fibers. *International Journal of Thermophysics*. 1988; 9 (5): 861-871.
- [207] Park C, Kim C, Kim M and Lee C. The effect of particle size and volume fraction of the reinforced phases on the linear thermal expansion in the Al–Si–SiCp system. *Materials Chemistry and Physics*. 2004; 88 (1): 46-52.
- [208] Arpón R, Molina JM, Saravanan RA, García-Cordovilla C, Louis E and Narciso J. Thermal expansion behaviour of aluminium/SiC composites with bimodal particle distributions. *Acta Materialia*. 2003; 51 (11): 3145-3156.
- [209] Nam TH, Requena G and Degischer P. Thermal expansion behaviour of aluminium matrix composites with densely packed SiC particles. *Composites Part A: Applied Science and Manufacturing*. 2008; 39 (5): 856-865.
- [210] Liu C, Zhang F, Zhang G and Naka M. Micro-X-ray diffraction study of thermal residual stresses in some model aluminium matrix composites. *Journal of Materials Science*. 2004; 39 (8): 2923-2925.
- [211] Benal MM and Shivanand HK. Influence of heat treatment on the coefficient of thermal expansion of al (6061) based hybrid composites. *Materials Science and Engineering: A*. 2006; 435–436 (0): 745-749.
- [212] Schöbel M, Altendorfer W, Degischer HP, Vaucher S, Buslaps T, Michiel MD and Hofmann M. Internal stresses and voids in SiC particle reinforced aluminium composites for heat sink applications. *Composites Science and Technology*. 2011; 71 (5): 724-733.
- [213] Shu K and Tu G. The microstructure and the thermal expansion characteristics of Cu/SiCp composites. *Materials Science and Engineering: A*. 2003; 349 (1): 236-247.
- [214] Jia Y, Cao F, Scudino S, Ma P, Li H, Yu L, Eckert J and Sun J. Microstructure and thermal expansion behaviour of spray-deposited Al–50Si. *Material Design*. 2014; 57 585-591.



- [215] Ma Yu-quan. Effect of high pressure heat treatment on microstructure and thermal expansion coefficients of cu-al alloy. *Materials Transactions*. 2013; Vol. 54 (No. 4): 540-543.
- [216] Handbook A. Volume 9. Metallography and Microstructures. 12 2005;
- [217] Nayar A. Testing of Metals. Tata McGraw-Hill Education. 2005.
- [218] Roy RK. A Primer on the Taguchi Method. Society of Manufacturing Engineers. 2010.
- [219] Farahany S, Bakhsheshi-Rad HR, Idris MH, Abdul Kadir MR, Lotfabadi AF and Ourdjini A. In-situ thermal analysis and macroscopical characterization of Mg-xCa and Mg-0.5Ca-xZn alloy systems. *Thermochimica Acta*. 2012; 527 (0): 180-189.
- [220] Vaneetveld G, Rassili A and Atkinson HV. Influence of parameters during induction heating cycle of 7075 aluminium alloys with RAP process. *Diffusion and Defect Data Pt.B: Solid State Phenomena*. 2008; 141-143 719-724.
- [221] Gowri S. Comparison of thermal analysis parameters of 356 and 359 alloys. *Transactions of the American Foundrymen's Society*. 1994; 102 (92-94): 503-508.
- [222] RI Mackay, MB Djurdjevic and JH Sokolowski. R Mackay, M Djurdjevic and J Sokolowski. Effect of cooling rate on fraction solid of metallurgical reactions in 319 alloy in *Transactions of the American Foundry Society and the One Hundred Fourth Annual Castings Congress*. 2000.
- [223] Jae-Ik Cho, Cheol-Woo Kim, Young-Chan Kim, Se-Weon Choi and Chang-Seog Kang. J Cho, C Kim, Y Kim, S Choi and C Kang. The Relationship between Dendrite Arm Spacing and Cooling Rate of Al-Si Casting Alloys in High Pressure Die Casting in ICAA13: 13th International Conference on Aluminium Alloys. 2014.
- [224] Veldman N, Dahle AK, StJohn D and Arnberg L. Dendrite coherency of Al-Si-Cu alloys. *Metallurgical and Materials Transactions A*. 2001; 32 (1): 147-155.
- [225] Chávez-Zamarripa R, Ramos-Salas JA, Talamantes-Silva J, Valtierra S and Colás R. Determination of the dendrite coherency point during solidification by means of thermal diffusivity analysis. *Metallurgical and Materials Transactions A*. 2007; 38 (8): 1875-1879.
- [226] Djurdjevic MB and Huber G. Determination of rigidity point/temperature using thermal analysis method and mechanical technique. *Journal of Alloys Compounds*. 2014; 590 500-506.
- [227] Kapranos P, Liu TY, Atkinson HV and Kirkwood DH. Investigation into the rapid compression of semi-solid alloy slugs. *Journal of Material Processing Technology*. 2001; 111 (1-3): 31-36.

- [228] Easton MA SD. Improved prediction of the grain size of aluminium alloys that includes the effect of cooling rate. *Materials Science and Engineering A*. 2008; 486 8-13.
- [229] Meylan B, Terzi S, Gourlay C and Dahle A. Dilatancy and rheology at 0–60% solid during equiaxed solidification. *Acta Materialia*. 2011; 59 (8): 3091-3101.
- [230] Lee W and Tang Z. Relationship between mechanical properties and microstructural response of 6061-T6 aluminium alloy impacted at elevated temperatures. *Material Design*. 2014; 58 116-124.
- [231] Zhang LY, Jiang YH, Ma Z, Shan SF, Jia YZ, Fan CZ, Wang WK. Effect of cooling rate on solidified microstructure and mechanical properties of aluminium A-356 alloy. *Journal of Materials Processing Technology*. 2008; 207 101-111.
- [232] Ahmad AH, Naher S and Brabazon D. The effect of direct thermal method, temperature and time on microstructure of a cast aluminium alloy. *Material and Manufacturing Processes*. 2014; 29 (2): 134-139.
- [233] Gonzalez G, Lara-Rodriguez G, Sandoval-Jiménez A, Saikaly W and Charai A. The influence of cooling rate on the microstructure of an Al–Ni hypereutectic alloy. *Material Characterization*. 2008; 59 (11): 1607-1612.
- [234] Mukherjee M, Ramamurty U, Garcia-Moreno F and Banhart J. The effect of cooling rate on the structure and properties of closed-cell aluminium foams. *Acta Materialia*. 2010; 58 (15): 5031-5042.
- [235] Zeer G, Pervukhin M and Zelenkova E. Effect of cooling rate on microstructure formation during crystallization of aluminium alloy 1417M. *Metal Science and Heat Treatment*. 2011; 53 (5-6): 210-212.
- [236] Gowri S and Samuel F. Effect of cooling rate on the solidification behaviour of Al-7 pct Si-SiC<sub>p</sub> metal-matrix composites. *Metallurgical and Materials Transactions A*. 1992; 23 (12): 3369-3376.
- [237] Dobrzański L, Maniara R and Sokolowski J. The effect of cooling rate on microstructure and mechanical properties of AC AlSi9Cu alloy. *Archives of Materials Science*. 2007; 106 106.
- [238] Satya SJ, Kumar V, Barekar NS, Biswas K and Dhindaw BK. Microstructural evolution under low shear rates during rheo processing of LM25 alloy. *Journal of Materials Engineering and Performance*. 2012; 21 (11): 2283-2289.
- [239] Reisi M and Niroumand B. Initial stages of solidification during semisolid processing of a transparent model material. *Materials Chemistry Physics*. 2012; 135 (2): 738-748.
- [240] Rovira M, Lancini B and Robert M. Thixo-forming of Al–Cu alloys. *Journal of Materials Processing Technology*. 1999; 92 42-49.

- [241] McPhee W, Schaffer G and Drennan J. The effect of iron on liquid film migration and sintering of an Al–Cu–Mg alloy. *Acta materialia*. 2003; 51 (13): 3701-3712.
- [242] A.H. Ahmad, S. Naher and D. Brabazon. Thermal profiles and fraction solid of aluminium 7075 at different cooling rate conditions. *Key Engineering Materials*. 2013; 554-557 582-595.
- [243] Bolouri A, Shahmiri M and Kang CG. Study on the effects of the compression ratio and mushy zone heating on the thixotropic microstructure of AA 7075 aluminium alloy via SIMA process. *Journal of Alloys Compounds*. 2011; 509 (2): 402-408.
- [244] Kim N and Kang C. An investigation of flow characteristics considering the effect of viscosity variation in the thixoforming process. *Journal of Materials Processing Technology*. 2000; 103 (2): 237-246.
- [245] Bolouri A and Kang CG. Characteristics of thixoformed A356 aluminium thin plates with microchannels. *Materials Characterization*. 2013; 82 86-96.
- [246] Yang B, Mao W and Song X. Microstructure evolution of semi-solid 7075 al alloy slurry during temperature homogenization treatment. *Transactions of Nonferrous Metals Society of China*. 2013; 23 (12): 3592-3597.
- [247] Taghavi F, Saghafian H and Kharrazi YH. Study on the effect of prolonged mechanical vibration on the grain refinement and density of A356 aluminium alloy. *Materials and Design*. 2009; 30 (5): 1604-1611.
- [248] Kocatepe K. Effect of low frequency vibration on porosity of LM25 and LM6 alloys. *Material and Design*. 2007; 28 (6): 1767-1775.
- [249] Chen Y, Liu L, Wang Y, Liu J and Zhang R. Microstructure evolution and thermal expansion of Cu-Zn alloy after high pressure heat treatment. *Transactions of Nonferrous Metals Society of China*. 2011; 21 (10): 2205-2209.
- [250] Lu K and Sui M. Thermal expansion behaviours in nanocrystalline materials with a wide grain size range. *Acta metallurgica et materialia*. 1995; 43 (9): 3325-3332.
- [251] Ji H, Yuan L and Shan D. Effect of microstructure on thermal expansion coefficient of 7A09 aluminium alloy. *Journal of Materials Science & Technology*. 2011; 27 (9): 797-801.
- [252] Kim BG, Dong S and Park SD. Effects of thermal processing on thermal expansion coefficient of a 50 vol.% SiCp/Al composite. *Materials Chemistry Physics*. 2001; 72 (1): 42-47.
- [253] M.V. Hyatt: *Aluminio 46* (1977) 81-99 in Lim, Seong Taek, Il Sang Eun, and Soo Woo Nam. Control of equilibrium phases (M, T, S) in the modified aluminium alloy 7175 for thick forging applications. *Materials Transactions* 44.1 (2003): 181-187.